

# A School of Engineering Seminar San Francisco State University

## Transparency and Data-Driven Operation in Smart Grids



SF STATE

**Dr. Reza Arghandeh,**

California Institute for  
Energy and Environment

UC Berkeley

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**1-2pm**

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### **Synopsis:**

The smart grid revolution is creating a paradigm shift in distribution networks that is marked by significant intermittency and uncertainty imposed by distributed energy resources on power systems. Distribution networks historically are lagging behind transmission networks in terms of observability, measurement accuracy, and data granularity. Grid modernization dramatically increases the need for tools to monitor and manage distribution networks and microgrids in a fast, reliable, and accurate fashion. Development of data-driven approaches to support required visibility and operational analytics is key to providing substantial enhancement in any societal scale infrastructure, e.g. electric grids. Visibility may allow us to anticipate imbalances and disturbances before they actually occur, giving us more time to prepare and respond. Measurement data analysis will allow for the visualization of power networks on multiple spatial and temporal scales. This talk will address opportunities and challenges of developing and implementing advanced monitoring technologies and data-driven decision making tools to support distribution network operation and control. Monitoring tools, such as phasor measurement units (PMUs), that have had success in the transmission system are ideal candidates for distribution network and microgrid applications.

### **Speaker Bio:**

**Reza Arghandeh** has been a postdoctoral scholar at the University of California, Berkeley's California Institute for Energy and Environment since 2013. He completed his Ph.D. in Electrical Engineering with a specialization in power systems at Virginia Tech. He holds Master's degrees in Industrial and System Engineering from Virginia Tech and in Mechanical Engineering from the University of Manchester. Dr. Reza Arghandeh has industrial and academic experience in physical-based modeling of transmission and distribution (T&D) networks, power system control and optimization, smart grid cyber-physical resilience, and smart grid big data analytics. From 2011 to 2013, he was a software designer at Electrical Distribution Design Inc. in Virginia, focusing on applications for the Distribution Engineering Workstation (DEW) software platform. He is a recipient of the Association of Energy Engineers (AEE) Scholarship, the UC Davis Green Tech Fellowship, and the best paper award from the ASME 2012 Power Conference. He is vice-chair of the IEEE Working Group on Electricity Transmission and Distribution Efficiency and chair of the ASME Renewable and Advanced Energy Committee.

For inquiries, please contact Dr. Hao Jiang at [jianghao@sfsu.edu](mailto:jianghao@sfsu.edu)